

### **WHAT IS CLAIMED IS:**

1. A method for encoding a video bit stream having a plurality of frames, each frame being composed of a plurality of blocks, the method

5 comprising:

re-constructing frame pixels of a reference frame after  
compressing the reference frame;

compressing the re-constructed frame pixels of the reference  
frame into compressed re-constructed frame pixels;

10 storing the compressed re-constructed frame pixels in a temporary  
storage device; and

decompressing the re-constructed frame pixels within a searching  
range of a target block when calculating a motion vector of the target block,  
wherein the target block of a target frame is to be encoded by reference to the  
15 reference frame using the motion vector.

2. The method of claim 1, wherein the re-constructed frame pixels  
are compressed into forms of groups of blocks (GOB), and at least one group of  
GOB within the searching range is decompressed when calculating the motion  
20 vector.

3. The method of claim 1, further comprising a step for compressing  
at least one block of pixel of the referencing frame into GOB, group of blocks  
and decompressing at least one GOB into block pixels of a predetermined  
25 searching range for best match block searching in motion estimation.

4. The method of claim 1, wherein a DPCM, Differential Pulse Modulation and a VLC, Variable Length Coding techniques are applied to reduce the bit rate of at least one block within at least one re-constructed frame  
5 pixels.

5. A method for encoding a bit stream of a picture composed of lines of pixels, comprising:

losslessly compressing at least one line of pixels ;

10 saving the at least one compressed line of pixels into a storage device; and

decompressing at least one pixel of at least one line of pixels for predicting the value of a target pixel to encode the target pixel.

15 6. The method of claim 5, wherein a prediction is done by calculating at least one pixels of the surrounding pixels of a target pixel.

7. The method of claim 5, wherein a DPCM and a VLC coding technique are applied to reduce the amount of pixel data.

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8. An apparatus for encoding a video stream, comprising:

a re-construction device for re-constructing frames pixels of a reference frame after the reference frame is compressed;

a compression device for compressing the re-constructed frame pixels

25 into compressed re-constructed frame pixels;

a temporary buffer for storing the compressed re-constructed frame  
pixels; and

a decompression device for decompressing pixels within a searching  
range of a target block when calculating a motion vector of the target block.

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9. The apparatus of claim 8, wherein a single silicon chip is  
implemented to integrate the above devices.

10. The apparatus of claim 9, wherein a single silicon chip integrating the  
10 above devices is implemented by a CMOS logic process.

11. The apparatus of claim 9, wherein a single silicon chip integrating the  
above devices is implemented by a DRAM process.

15 12. The apparatus of claim 9, wherein a single silicon chip integrating the  
above devices is implemented by a Non-Volatile Memory process.

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